


I CLAIM:

1. A bone staple for correcting bone deficiencies by controlling the growth of the epiphyseal plate, the staple comprising:

a shape memory material body comprising a cross bar and at least two legs extending from the cross bar and normally diverging from each other, wherein the legs define spring legs tending to expand apart from each other when subject to a compression force, whereby when the staple is introduced into a bone with each leg at each side of the epiphyseal plate under a compression force bringing the legs to be closer than in a normal position the legs exert a expansion force for lengthening the epiphyseal plate while the cross bar keeps a normal length thereof forming a tether for a periphery of the epiphyseal plate, thus causing the epiphyseal plate to growth around a focus.



2. The staple of claim 1, wherein each leg normally defines an angle of between about 91° to about 180° degrees relative to the cross bar.

3. The staple of claim 1, wherein the shape memory staple body is made of nitinol.

4. A method for installing the staple of claim 1 into a bone, for correcting bone deficiencies by controlling the growth of the epiphyseal plate, the method comprising:

i. providing said staple with the legs normally diverging from each other,

ii. applying a compression force to the legs and bringing the legs into a substantially parallel position, and

iii. nailing the staple into the bone with at least one leg nailed at each side of the epiphyseal plate, whereby the staple will be retained into the bone with the legs exerting an expansion force over the epiphyseal plate while the cross bar will exert a suppression effect on the periphery of the epiphyseal plate.

5. The method of claim 4, wherein the step of nailing comprises:

drilling orifices in the bone for receiving the legs of the staple.

6. The method of claim 4, wherein the step of nailing comprises:

nailing the staple directly into the bone by hammering the staple on the bone.

7. A bone staple for correcting bone deficiencies by controlling the growth of the epiphyseal plate, the staple comprising:

a body comprising a cross bar and at least two legs extending from the cross bar, and

stop means at the corner joint between the cross bar and the legs for abutting the bone, the cross bar defining an arc shape extending between the legs and at a level higher than the stop means, whereby when the staple is installed into the bone the arc shaped cross bar remains spaced apart from the epiphyseal plate.

8. The staple of claim 7, wherein the stop means comprises a shoulder normally extending from the corner joint, the shoulder being curved to prevent stresses concentration.

9. The staple of claim 7, wherein the stop means comprises a shoulder forming a reinforcing means at each corner joint between the legs and the cross bar, the reinforcing means operating to oppose any diverging movement of the legs away from each other.

10. The staple of claim 7, wherein the cross bar extends beyond said corner joint and the stop means for

abutting the bone is formed in the extension of the cross bar.

11. A method for installing the bone staple of claim 7, for correcting bone deficiencies by controlling the growth of the epiphyseal plate, the method comprising:

- i. providing said staple,
- ii. placing the staple with the cross bar spanning across the epiphyseal plate, and
- ii. nailing the staple into the bone with at least one leg nailed at each side of the epiphyseal plate, whereby the stop means abut against the bone at each side of the epiphyseal plate and the arc shaped cross bar remains spaced apart from the epiphyseal plate.

12. The method of claim 11, wherein the step of nailing comprises:

drilling orifices in the bone for receiving the legs of the staple.

13. The method of claim 11, wherein the step of nailing comprises:

nailing the staple directly into the bone by hammering the staple into the bone.

14. A bone staple for repairing bones and correcting bone deficiencies, the staple comprising:

a body comprising a cross bar and at least two legs extending from the cross bar, wherein each leg includes an helical thread designed for anchoring into the bone, the cross bar being designed to be cut whereby once the bone deficiency is overcome and the staple is anchored the cross bar is cut and each leg is unscrewed and removed from the bone.

15. The staple of claim 14, wherein the helical thread defines a screw in each leg of the staple.

16. The staple of claim 14, wherein the helical thread is defined by a longitudinal cross section comprising an upper flat plane and a lower inclined plane, both planes helically extending around the corresponding leg.

17. A method for installing and removing the bone staple of claim 14, for repairing bones and correcting bone deficiencies, the method comprising:

- i. providing said staple,
- ii. installing the staple by inserting the legs of the staple into the bone,

iii. waiting for a period of time enough for repairing the bone or correcting the bone deficiency, wherein the staple legs are anchored into the bone,

iv. cutting the cross bar in a location between the legs, and

v. removing each leg from the bone by gripping and unscrewing the leg from the bone.

18. The method of claim 17, wherein the installing step comprises nailing the staple into the bone.

19. The method of claim 18, wherein the step of nailing comprises:

drilling orifices in the bone for receiving the legs of the staple.

20. The method of claim 18, wherein the step of nailing comprises:

nailing the staple directly into the bone by hammering the staple on the bone.

21. The staple of claim 1, further comprising retaining means at each side of the cross bar, the retaining means being defined by at least one ear for receiving fastening means.